

CLAIMS

5 1. Method of inserting a message in a subset (VO) of digital data representing physical quantities, characterised in that it includes the steps of:

- estimating (E4) a capacity to receive a message for said subset,
- selecting (E5) a message with a size less than or equal to the estimated capacity, in a set of messages,

10 - inserting (E6) the selected message in the said subset of digital data.

15 2. Insertion method according to Claim 1, characterised in that it includes a prior step (E2) of producing the set of messages, said messages having different sizes.

20 3. Insertion method according to Claim 2, characterised in that each message with a size which is not the largest in the set of messages is deducible from another message with a larger size and included in the set of messages.

25 4. Insertion method according to any one of Claims 1 to 3, characterised in that the message is selected (E5) so that its size is just less than or equal to the estimated capacity for said subset of digital data.

25 5. Insertion method according to any one of Claims 1 to 4, characterised in that said subset (VO) of digital data has an arbitrary shape.

30 6. Insertion method according to any one of Claims 1 to 5, characterised in that said subset (VO) of digital data corresponds to an object characterizing a semantic entity of the set of digital data.

7. Insertion method according to any one of Claims 1 to 6, characterised in that it also includes the prior steps of:

- segmenting (E1) the digital data into regions,
 - selecting (E3) at least one region in order to constitute said subset.

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8. Insertion method according to any one of Claims 1 to 7, characterised in that the insertion (E6) of the message includes, for each element of the message, the choice of coefficients in said subset and the modulation of the element on the values of the chosen coefficients.

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9. Insertion method according to any one of Claims 1 to 8, characterised in that the estimation (E4) of the capacity includes the calculation of the minimum number of coefficients necessary for inserting a message element so as to be able to detect this element with a predetermined correct detection probability

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10. Insertion method according to any one of Claims 1 to 7, characterised in that it includes steps of:

- segmenting (E400) the subset into blocks,
 - transforming (E403, E404) the blocks by means of a reversible operation, prior to the insertion step,
 - and in that the insertion step proper includes the steps of:
 - selecting (E601) a group of coefficients in a transformed block, for part of the message to be inserted,
 - coding (E603) the element to be inserted according to the relative positions of the coefficients of the selected group.

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11. Insertion method according to Claim 10, characterised in that the estimation (E407) of the capacity includes the search for the number of usable groups according to a predetermined rule.

12. Method of extracting a message inserted by the method according to any one of Claims 1 to 11, in a subset of digital data representing physical quantities, characterised in that it includes steps of:

- extracting (E105, E106) the message,
- 5 - comparing the extracted message with messages stored in memory,
- identifying the fact that the extracted message belongs to a set of stored messages.

10 13. Device for inserting a message in a subset (VO) of digital data representing physical quantities, characterised in that it has:

- means (3) of estimating a capacity to receive a message for said subset,
- means (4) of selecting a message with a size less than or equal to 15 the estimated capacity, in a set of messages,
- means (5) of inserting the selected message in the said subset of digital data.

20 14. Insertion device according to Claim 13, characterised in that it also has means of producing the set of messages, said messages having different sizes.

25 15. Insertion device according to Claim 14, characterised in that the production means are adapted to form each message with a size which is not the largest in the set of messages so as to be deducible from another message with a greater size and included in the set of messages.

30 16. Insertion device according to any one of Claims 13 to 15, characterised in that the selection means (4) are adapted to select the message so that its size is just less than or equal to the estimated capacity for said subset of digital data.

17. Insertion device according to any one of Claims 13 to 16, characterised in that it is adapted to consider a subset (VO) of digital data which is arbitrary in shape.

5 18. Insertion device according to any one of Claims 13 to 17, characterised in that it is adapted to consider a subset (VO) of digital data which corresponds to an object characterizing a semantic entity of the set of digital data.

10 19. Insertion device according to any one of Claims 13 to 18, characterised in that it also has:

- means (1) of segmenting the digital data into regions,
- means (2) of selecting at least one region in order to constitute said subset.

15 20. Insertion device according to any one of Claims 13 to 19, characterised in that the means (5) of inserting the message are adapted to make, for each element of the message, the choice of coefficients in said subset and the modulation of the element on the values of the chosen 20 coefficients.

25 21. Insertion device according to any one of Claims 13 to 20, characterised in that the means (3) of estimating the capacity are adapted to calculate the minimum number of coefficients necessary for inserting a message element so as to be able to detect this element with a predetermined correct detection probability.

22. Insertion device according to any one of Claims 13 to 19, characterised in that it has:

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- means of segmenting the subset into blocks,
 - means of transforming the blocks by means of a reversible transformation, prior to the insertion step,

and in that the insertion means (5) have:

- means of selecting a group of coefficients in a transformed block, for an element of the message to be inserted,
- means of coding the element to be inserted according to the relative values of the coefficients of the selected group.

23. Insertion device according to Claim 22, characterised in that the means of estimating the capacity are adapted to seek the number of groups which can be used according to a predetermined rule.

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24. Device for extracting a message inserted by the device according to any one of Claims 13 to 23, in a subset of digital data representing physical quantities, characterised in that it has:

- means of extracting the message,
- means of comparing the extracted message with messages stored in memory,
- means of identifying the fact that the extracted message belongs to a set of stored messages.

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25. Insertion device (10) according to any one of Claims 13 to 23, characterised in that the estimation, selection and insertion means are incorporated in:

- a microprocessor (100),
- a read-only memory (102) containing a program for processing the data, and
- a random access memory (103) containing registers adapted to record variables modified during the running of said program.

26. Extraction device (10) according to Claim 24, characterised in
30 that the extraction, comparison and identification means are incorporated in:

- a microprocessor (100),

- a read-only memory (102) containing a program for processing the data, and
 - a random access memory (103) containing registers adapted to record variables modified during the running of said program.

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27. Digital signal processing apparatus, characterised in that it has means adapted to implement the method according to any one of Claims 1 to 12.

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28. Digital signal processing apparatus, characterised in that it includes the device according to any one of Claims 13 to 26.

29. Storage medium storing a program for implementing the method according to any one of Claims 1 to 12.

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30. Storage medium according to claim 29, characterised in that said storage medium is detachably mountable on a device according to any one of Claims 13 to 26.

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31. Storage medium according to claim 29 or 30, characterised in that said storage medium is a floppy disk or a CD-ROM.

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32. Computer program on a storage medium and comprising computer executable instructions for causing a computer to insert a message in a subset of digital data representing physical quantities according to any one of claims 1 to 11.

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33. Computer program on a storage medium and comprising computer executable instructions for causing a computer to extract a message inserted in a subset of digital data representing physical quantities according to claim 12.